What is claimed is:

1. A laser plasma X-ray generating apparatus in which:

a target material that is chemically inactive and lies in a gas-state at a room temperature is supplied under a gas-state to contact with an exterior surface of a rotating cylindrical body which is cooled at a very low temperature using a refrigerant carrier such as a liquid nitrogen and thereby being cooled and solidified, resulting in forming a cryo-target layer which is built up on an exterior surface of said rotating cylindrical body;

a pulse laser beam having a high-peak power that is repeatedly outputted at a desired frequency is converged and irradiated onto a surface of said cryo-target layer, while by displacement of said rotating cylindrical body in its rotating direction or its axle direction, or by displacement thereof of combination of both in its rotating direction and in its axle direction, the surface of said rotating cylindrical body having said cryo-target layer is moved in its surface direction with relative to a converging and irradiating point of said pulse laser beam that is fixed in a space manner;

a high-temperature and high-density plasma is produced by converging and irradiating said pulse laser beam, while a cryo-target layer on which crater holes generated by plasma operation by converging and irradiating of said pulse laser beam is repaired by continuously supplying said target material thereto; and

a pulse X-ray is continuously and repeatedly generated from said high-temperature and high-density plasma,

said laser plasma X-ray generating apparatus being characterized in that said target material supplied under a gas-state onto said exterior surface of said rotating cylindrical body is cooled using a gas at a very low temperature that is generated from the refrigerant carrier used for cooling said rotating cylindrical body.

2. The laser plasma X-ray generating apparatus according to claim 1 characterized in that said target material is cooled by introducing said gas at the very low temperature that is generated from said refrigerant carrier used for cooling said cylindrical body to the periphery of a conduit for transporting said target material toward said exterior surface of said rotating cylindrical body lying in a gas state.

3. The laser plasma X-ray generating apparatus according to claim 1 or 2 characterized in that said target material is cooled by introducing said gas

at the very low temperature that is generated from said refrigerant carrier used for cooling said cylindrical body to the periphery of wall for enclosing said transported target material under the gas-state at the periphery of said rotating cylindrical body.